

Murderers beware: 'virtual autopsies' could revolutionize investigations

Level 3 • Advanced

1 New words

a. Scan the article to find the answers to these questions.

1. Which words are combined to make up this new word?

Virtopsy = _____ & _____

2. Which two high-tech machines are used in a Virtopsy process?

_____ & _____

b. Which words do you think are combined to make up this new word?

Virtobot = _____ & _____

2 Key words

a. Write the key words from the article next to the definitions below. Then find the words in the article to read them in context.

complement
state-of-the-art
scalpel

consistency
autopsy
substantiate

corpse
non-invasive
undermine

disfigurement
pioneer
undetected

1. describes equipment or technology that uses the newest and most advanced ideas and features _____
 2. a medical examination of a dead person's body to find out why they died _____
 3. to do something for the first time before everyone else _____
 4. a small sharp knife used by a doctor for doing an operation or autopsy _____
 5. the body of a dead person _____
 6. cannot be proven to be there using scientific methods _____
 7. to add another thing (a benefit) to something _____
 8. to make something become gradually less effective or successful _____
 9. to provide evidence that proves something _____
 10. the degree to which a substance is thick, smooth or firm _____
 11. the spoiling of the appearance of something or somebody _____
 12. describes a medical test or treatment that does not involve cutting your body or putting instruments inside it _____
- b. Which word class do the key words belong to? Write *n* (noun), *v* (verb) or *a* (adjective) after each word. Some of the key words can be both a noun and a verb. Write *n&v* after these words.

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According to inventors of system, Virtopsies allow detection of injuries often undetectable using traditional methods

Kate Connolly in Berlin
7 January, 2013

- 1 The inventor of a state-of-the-art computer-assisted autopsy system that is increasingly being used in European hospitals has claimed the technique could eventually mean there is no such thing as a 'perfect murder'.
- 2 The method, called 'Virtopsy', is now being used at selected forensic medical institutes in Europe, having been pioneered by a group of scientists at the University of Zurich. Instead of reaching for the scalpel and making the Y-shaped incision in the chest with which a traditional autopsy begins, pathologists are now able to examine the corpse in 3-D via computer screens.
- 3 Michael Thali, the Director of Zurich's Institute for Forensic Medicine in Europe, and one of the inventors of Virtopsy, said it had the potential to revolutionize criminal investigations. "Basically there will be no such thing as the perfect murder any more as a virtual autopsy allows you to find every piece of evidence," he said.
- 4 Virtopsies combine the images from high-powered magnetic resonance imaging (MRI), computed tomography (CT) and surface scans of dead bodies. Combined, the devices are referred to as a 'Virtobot'. The technique allows the detection of injuries such as lesions and blows often undetectable during a traditional autopsy, as well as air pockets, heart attacks and even cancer.
- 5 "The Virtopsy has the potential to replace the autopsy one day," Richard Dirndorfer, one of the pioneers of DNA analysis in criminology, and a founder developer of Virtopsy, told the German science magazine *PM*. "I think we'll see it happen gradually, just like DNA analysis gradually replaced blood group analysis," he said.
- 6 The computer imaging techniques allow doctors to gain in-depth insights into the deepest interiors of dead bodies. The method has already allowed the discovery of haemorrhages and fractures that were not picked up during conventional autopsies. The initial aim is to use the new method to complement the traditional autopsy.
- 7 "It will enable forensic scientists to plan their autopsies far more efficiently," Dominic Wichmann, an internal medicine specialist at Hamburg's University Hospital, told *Spiegel*. Criminologists from around the world have been travelling to Switzerland over the past few years to see the development of the new method for themselves.
- 8 The US forensic medical drama *CSI* has already twice featured Virtopsies. In one, the system was able to prove that a murder victim was killed by a bullet through the cheek; in another, a Virtopsy on a murdered man meant his wish to be cryogenically frozen could still go ahead as his body remained intact.
- 9 The method has been under development for decades, with the scientists behind it first housed in an unheated laboratory on a university campus where they were considered a bit of a laughing stock. Later, a donation from a rich ophthalmologist enabled the project to take off. Even then it was initially rejected for its potential to undermine the traditional skills of forensic scientists and pathologists. But a new generation appears to be seeing it as less of a threat and rather as something that will complement and substantiate conventional methods and possibly even one day replace them, though probably not entirely.
- 10 "In order to analyze the colour of the blood, the consistencies (of body fluids) or smells, we'll need to keep on with the conventional cut," said Lars Oesterhelweg, Deputy Director of the Institute of Forensic Medicine at the Charité Hospital in Berlin, which is using a version of the Virtopsy.
- 11 He added that the new method was particularly helpful in re-examining cases where the cause of death was unclear. "It means that third opinions can be gathered, investigations can be re-examined and cases can be reopened," he said.
- 12 Scientists using the new method said that relatives of the dead, who are often reluctant for autopsies to be carried out because of the disfigurement they cause, were much keener on the non-invasive method.

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3 Comprehension check

Answer these questions with information from the article.

1. In which country was the method of Virtopsy invented and developed and where is it being used?
2. Why was the method rejected at first?
3. What act allowed the project of Virtopsies to move forward?
4. What can a Virtopsy detect that a traditional autopsy cannot?
5. What can a Virtopsy not detect that a traditional autopsy can?
6. Why might relatives of a dead person prefer a Virtopsy to a traditional autopsy?
7. In which area of criminology and detective work might Virtopsies be used?

4 Multi-word expressions

Explain what the underlined parts of these expressions mean. Locate them in the article to find what they refer to.

1. the potential to revolutionize criminal investigations
2. gain in-depth insights
3. a bit of a laughing stock
4. enabled the project to take off

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5 Job titles

Complete the table.

job title	title/position in your language	where this person might work	this person's tasks & responsibilities
criminologist			
pathologist			
forensic scientist			
ophthalmologist			
internal medicine specialist			

6 Discussion

- Michael Thali says: "Basically there will be no such thing as the perfect murder any more." Discuss the use of the words 'any more' in the quote.
- What, in your opinion, is 'the perfect murder'? Does it exist?
- How have methods of investigating and detecting murders changed in the past hundred years?

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KEY

1 New words

- a.
1. virtual; autopsy
2. MRI; CT
- b.
virtual; robot

2 Key words

1. state-of-the-art (a)
2. autopsy (n&v; in article, n; in British English, *postmortem* is often used instead of *autopsy*.)
3. pioneer (n&v; in article, v)
4. scalpel (n)
5. corpse (n)
6. undetectable (a)
7. complement (n&v; in article, v)
8. undermine (v)
9. substantiate (v)
10. consistency (n)
11. disfigurement (n)
12. non-invasive (a)

3 Comprehension check

1. in Switzerland; in some European countries
2. because it was thought it might undermine the traditional skills of forensic scientists and pathologists
3. a donation of money from a rich ophthalmologist
4. abnormalities in the deepest interiors of dead bodies
5. the colour of blood, the consistencies of fluids and smells
6. because it does not involve disfigurement
7. unsolved cases

4 Multi-word expressions

1. the possibility to completely change something (refers to the Virtopsy)
2. a thorough and detailed understanding of something (refers to the computer imaging techniques)
3. someone or something that everyone thinks is very silly (refers to the scientists who developed the Virtopsy)
4. become successful or popular very fast (refers to the donation)

5 Job titles

Teacher's note: The answers in columns 2 and 3 are suggestions only; students' answers may vary. This task can be carried out in class as group work or completed at home as a web research task.

title/position	where this person might work	this person's tasks & responsibilities
criminologist	university, law enforcement agencies, think tanks	examine the systems by which people accused of crimes are brought to justice, attempt to explain the reasons for criminal behaviour and suggest ways crime might be reduced
pathologist	hospital lab, mortuary	use laboratory procedures to identify and diagnose the presence and stages of diseases and possible sources of infection in body tissues, fluids, secretions and other specimens and identify the cause of death
forensic scientist	forensic institute attached to the police, Interpol	apply scientific procedures and techniques to the examination of potential evidence that may assist in legal investigations
ophthalmologist	hospital, their own practice	diagnose and treat diseases, injuries and deficiencies of the eye
internal medicine specialist	hospital, their own practice	focus on the diagnosis, treatment and prevention of nonsurgical conditions in adults